CAN THE BRIGADE S2 EFFECTIVELY INTEGRATE THE CAPABILITIES OF THE ALL-SOURCE ANALYSIS SYSTEM?

A thesis presented to the Faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE

by

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B.A., University of Minnesota, Minneapolis, Minnesota, 1981

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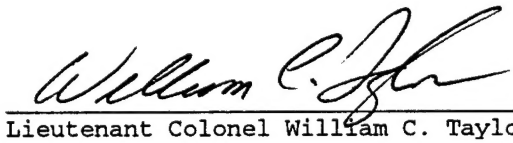
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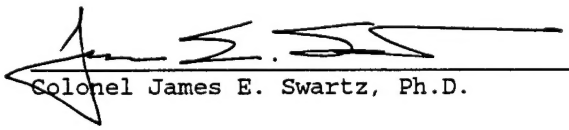
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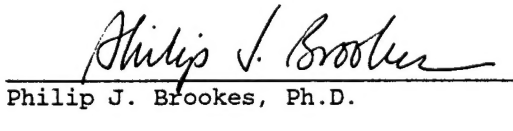
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ABSTRACT

CAN THE BRIGADE S2 EFFECTIVELY INTEGRATE THE CAPABILITIES OF THE ALL-SOURCE ANALYSIS SYSTEM? by MAJ Timothy H. Frank, USA, 93 pages.

This study examines the maneuver brigade S2's ability to integrate the capabilities of the All Source Analysis System (ASAS) into the brigade's intelligence operations. The study begins by defining the problem of intelligence support to the maneuver brigade commander based on observations from training exercises and Operation DESERT STORM. The author then reviews the Army's plan to correct many of the maneuver brigade S2's intelligence problems by equipping him with ASAS.

Based on the Army's original intent of fielding ASAS no lower than the division level, the author provides a framework with which to analyze the problem: First through an analysis of how the maneuver brigade S2 is currently organized, the field environment in which he operates, and how he doctrinally performs his intelligence mission; and second by examining the capabilities and limitations of the ASAS itself.

The study concludes that the maneuver brigade S2 will be able to effectively integrate the capabilities of ASAS only if he retains his current level of manpower and is provided with access to adequate training resources. The ASAS, while significantly improving the S2's ability to produce intelligence, does not reduce his requirement for personnel. Instead, the complexity of ASAS dictates that the S2 must provide his personnel with a much more robust training program in order to fully benefit from the system's capabilities.

TABLE OF CONTENTS

	Page
APPROVAL PAGE	ii
ABSTRACT	iii
LIST OF ILLUSTRATIONS	v
LIST OF ABBREVIATIONS	vi
CHAPTER	
1. INTRODUCTION	1
2. REVIEW OF LITERATURE	12
3. RESEARCH METHODOLOGY	18
4. BRIGADE INTELLIGENCE OPERATIONS	24
5. ASAS CAPABILITIES AND LIMITATIONS	48
6. CONCLUSIONS	74
ILLUSTRATIONS	78
ENDNOTES	80
BIBLIOGRAPHY	87
INITIAL DISTRIBUTION LIST	93

LIST OF ILLUSTRATIONS

Figure		Page
1.	Current Manning for G2/ACE and Brigade S2	78
2.	Analysis Control Team	79
3.	Direct Support Intelligence Company	79

LIST OF ABBREVIATIONS

ACE	ANALYSIS CONTROL ELEMENT
ACT	ANALYSIS CONTROL TEAM
ARTEP	ARMY TRAINING AND EVALUATION PLAN
ASAS	ALL SOURCE ANALYSIS SYSTEM
ASAS-AS	ALL SOURCE ANALYSIS SYSTEM - ALL SOURCE
ASAS-RWS	ALL SOURCE ANALYSIS SYSTEM - REMOTE WORK STATION
ASAS-SS	ALL SOURCE ANALYSIS SYSTEM - SINGLE SOURCE
ASCDB	ALL SOURCE COLLATED DATABASE
BCTP	BATTLE COMMAND TRAINING PROGRAM
BICC	BATTLE INFORMATION COORDINATION CENTER
CALL	CENTER FOR ARMY LESSONS LEARNED
COA	COURSE OF ACTION
CSTA	COMBAT SYSTEMS TEST ACTIVITY
DS	DIRECT SUPPORT
EAC	ECHELONS ABOVE CORPS
FM	FIELD MANUAL
G2	PRIMARY STAFF OFFICER, INTELLIGENCE, DIVISION AND HIGHER
GPS	GLOBAL POSITIONING SYSTEM
HUMINT	HUMAN INTELLIGENCE
IEW	INTELLIGENCE & ELECTRONIC WARFARE
IEWSE	INTELLIGENCE AND ELECTRONIC WARFARE SUPPORT ELEMENT
IMINT	IMAGERY INTELLIGENCE
INTSUM	INTELLIGENCE SUMMARY
IPB	INTELLIGENCE PREPARATION OF THE BATTLEFIELD
IR	INTELLIGENCE REQUIREMENTS
MCOO	MODIFIED COMBINED OBSTACLE OVERLAY
MCS	MANEUVER CONTROL SYSTEM
MI	MILITARY INTELLIGENCE
MSE	MULTIPLE SUBSCRIBER EQUIPMENT
NAI	NAMED AREA OF INTEREST
OB	ORDER OF BATTLE
O&I	OPERATIONS AND INTELLIGENCE
OPORD	OPERATIONS ORDER
PIR	PRIORITY INTELLIGENCE REQUIREMENTS
R&S	RECONNAISSANCE AND SURVEILLANCE
S2	PRIMARY STAFF OFFICER, INTELLIGENCE, BRIGADE AND BELOW
SCI	SENSITIVE COMPARTMENTED INFORMATION
SIGINT	SIGNALS INTELLIGENCE
SITMAP	SITUATION MAP
TOC	TACTICAL OPERATIONS CENTER
UAV	UNMANNED AERIAL VEHICLE

CHAPTER 1

INTRODUCTION

The continuing objective of the Army's war fighting concept for Intelligence and Electronic Warfare (IEW) is to create a seamless intelligence structure, from national to maneuver battalion level, which will provide the intelligence essential to executing all tactical missions.[1] One of the deficiencies identified by the Army in striving for such an intelligence structure has been an inadequate capability to process and disseminate intelligence in support of the maneuver brigade commander. Though valuable intelligence is available from a variety of sources, the maneuver brigade commander lacks an effective means to access and fuse it into a timely and useable product. In correcting this deficiency, the Army has decided to field the All Source Analysis System (ASAS), an automated computer system that can rapidly process large volumes of combat information and sensor reports from multiple sources to produce a fused, all-source picture of the battlefield and provide timely and accurate targeting information, intelligence products, and threat alerts.[2] The ASAS will be fielded to the maneuver brigade and to the organization that supports it with intelligence, the direct support (DS) intelligence company.

The ASAS utilizes state-of-the-art technology to provide combat commanders with access to intelligence from all levels: national, theater, and tactical. As a system, it represents a substantial advance

in the Army's technical ability to process and disseminate intelligence directly to the tactical commander. The ASAS, however, was initially designed to support commanders only down to the division level. The decision to field it in support of maneuver brigades was made only after the Military Intelligence (MI) Relook Task Force highlighted the dissemination and processing problems experienced during the operation. The MI Relook Task Force was headed by Major General John Stewart, Third Army Intelligence Officer (G2) during Operation DESERT STORM, and was tasked to study intelligence issues following that operation. A division's intelligence staff, however, is more robust than that of a maneuver brigade. One finding of the MI Relook Task Force was that combat commanders perceived that G2 staffs were too large compared to their counterpart at brigade, that the brigade did not receive a corresponding level of support (Figure 1).[3] While the division may be able to readily integrate the ASAS into its intelligence operations, the brigade may not have the same capability with its current staffing. This leads to the thesis question of this study: Can the maneuver brigade intelligence officer (S2) effectively integrate the capabilities of ASAS into the brigade's operations?

Statement of the Problem

A brigade commander should be concerned whether or not his S2 will be able to effectively integrate the capabilities of ASAS into the brigade's combat operations. While the concept for ASAS promises significant capabilities that support the S2's functions, the S2 may not be capable of integrating them with his current organization and doctrine. To analyze how and if the S2 can effectively integrate the

capabilities of the ASAS requires answers to some specific questions. First, how does the S2 and his intelligence operations support the maneuver brigade commander? Second, what intelligence problems in the maneuver brigade does the Army intend to correct with ASAS? Third, what are the intelligence capabilities and limitations of the ASAS and how will they affect the S2's ability to support his commander? Fourth, what are ASAS's requirements for communications, transportation, power, and training support, and how will they affect the system's usefulness to the brigade?

How the S2 section is doctrinally organized and functions is important to the S2's ability to integrate the new capabilities provided by ASAS. To fully utilize the system, the S2 may require organizational changes involving equipment and personnel. Current intelligence and staff processes may also prove inadequate and require revision. With the current force draw down and the Army's restriction of adding additional positions to the force structure, augmenting personnel to support the S2 staff will mean that there will have to be reductions somewhere else. Augmenting the brigade S2 staff could adversely affect the DS intelligence company's ability to provide support to the brigade in other areas, such as interrogation or imagery intelligence (IMINT). To fully understand the impact of the ASAS on the S2 requires the analysis of the intelligence processes used, the intelligence products produced, his interaction with the brigade commander and his staff, his relationship/interaction with the division G2 and subordinate battalion S2's, and his habitual relationship with the DS intelligence company which provides him intelligence support.

Since the Army is fielding ASAS to support maneuver brigades, it is necessary to examine the intelligence problems that the system is intended to resolve. Interviews with combat commanders following Operation DESERT STORM revealed that the most critical intelligence problem faced by the maneuver brigade was the poor dissemination of intelligence products. All too often, commanders received intelligence from higher headquarters too late to put it to effective use.[4] Instead of the predictive analysis they needed, commanders received what amounted to reporting of dated events. According to Army doctrine, the intelligence officer at each level of command is responsible for providing tactical intelligence tailored to his commander's requirements.[5] During Operation DESERT STORM, however, the attack advanced so fast that it was largely intelligence from division, corps, and theater that guided operations for the maneuver brigade commander.[6]

The inability to rapidly disseminate intelligence was not the only problem the commanders saw. Poorly focused intelligence production at theater met the minimum standards in satisfying the tactical commander's priority intelligence requirements (PIR). The lack of graphic intelligence products and access to higher echelon intelligence database updates inhibited the commander's ability to keep abreast of the current situation.[7]

The intelligence capabilities that the ASAS provides to the brigade will largely decide its usefulness to the S2. Access to all echelons of intelligence production should prove valuable to the S2. However, how well the system fits into the S2's intelligence processes is key to its effective use. A system that provides too much

information may be as ineffective as a system that provides too little in a time-constrained environment. The limitations of ASAS are as important as the system's capabilities. When viewed from the perspective of total integration, what the system cannot do may become more important than what it can do.

The support required to operate the ASAS will either enhance or detract from its potential for solving some of the intelligence problems for the maneuver brigade. Support that must be considered include those for communications, power, transportation, manpower, and training. In addition to the S2's ASAS, the DS intelligence company's ability to integrate their ASAS's operating requirements with the supported brigade's operations will be critical to its success. Major Antoinette G. Smart, studying intelligence reorganization, concluded that implementation of new intelligence concepts will require focus on doctrine revision, training, and leader development.[8] ASAS, as part of the S2 section and the DS intelligence company's new Analysis Control Team (ACT), promises capabilities that will require the S2 and the brigade commander to review their focus as well.

Background

Historically, the dissemination of national and theater-level intelligence to corps and divisions has been tenuous even during the best of times. For the brigade, the ability to obtain intelligence from sources above corps was virtually nonexistent. This inability to obtain national and theater-level intelligence was mainly due to the lack of access to highly sensitive intelligence, especially from national sources. Quite often the intelligence was compartmentalized to

safeguard against compromising its source and could not be provided directly to the tactical commander. The focus of the intelligence on supporting the leadership above corps also made it unsuitable for tactical use. In addition, and perhaps more important, tactical commanders did not have the assets to effectively access the national and theater intelligence systems. Instead, the tactical commander would have to request intelligence from higher headquarters and rely on their responsiveness. This system was neither timely nor efficient. Division G2s attempted to solve this problem during Operation DESERT STORM by sending liaison personnel to higher headquarters to extract and send back relevant intelligence. While this may have eased the dissemination problem for the division, it was impossible to replicate by the brigade S2 whose already austere staff was needed to provide tailored tactical intelligence to the commander.

The value of national and theater-level intelligence to the tactical commander long has been recognized. Operation DESERT STORM is a perfect example, since national and theater sources provided most of the intelligence supporting the tactical commander's intelligence preparation of the battlefield (IPB). Once the ground war started, however, there was a significant problem in the dissemination of intelligence to the tactical commanders. An interview of combat commanders conducted after the operation revealed that, though brigade commanders had good remarks about their S2s, they were dissatisfied with the intelligence support they received.[9]

Only recently has technology developed sufficiently to make effective access to national and theater-level intelligence possible for

the combat commander. Though the ASAS concept was first conceived in the late 1970s, technological developments delayed the initial fielding of the system until after Operation DESERT STORM in 1991. Operation DESERT STORM confirmed the need for a system with the capabilities of the ASAS. Under the current fielding plan, combat commanders down to the battalion level will have the access they need to obtain intelligence.

Scope of Analysis

The scope of this study will be limited to the perspective of the maneuver brigade. The brigade has been one of the most difficult levels of command to support with intelligence timely enough and detailed enough for its mission. The study will examine the problems of intelligence support to the maneuver brigade with focus on those problems that the fielding of ASAS is intended to solve. The ASAS itself will be examined for its capability to help solve those problems and for the demands it will place on the brigade intelligence system. Doctrinally, this will be a study of the S2 as the primary staff officer responsible for intelligence and the DS intelligence company, which provides intelligence support to the maneuver brigade. Limiting the scope to the S2's perspective will facilitate an objective analysis of the intelligence problems faced by the brigade commander and the S2's ability to integrate the capabilities of the ASAS to solve those problems.

Importance to Future Operations

Purpose

This topic is important because the Intelligence Corps has historically had a difficult time supporting the maneuver brigade commander with adequate intelligence. The Army is fielding the ASAS to such commanders to provide them the intelligence needed to win the fight. How well the commander's principal staff officer for intelligence can integrate the capabilities of the ASAS into his operations will determine its usefulness to him.

Discussion

The Army developed the ASAS to provide the tactical commander greater access to the intelligence he needs. However, integrating a new system into tactical operations is never painless. Not only will technical problems with the system have to be worked out, but doctrinal and operational problems will as well. For example, when the Bradley Fighting Vehicle was fielded to the 2nd Armored Division at Ft. Hood, though it was not the first division to receive them, the initial battalions to get them used tactics more suited to armored warfare. While such tactics are inappropriate for mechanized infantry, the response was a natural one considering the soldier's enthusiasm at the Bradley's significant improvement over the M113. Only through training and experience did units develop the proper tactics to maximize their use of the system. This problem also applies to new intelligence systems. Not only will units have to become familiar with the system's capabilities, but also they must relook intelligence doctrine and how the system is employed in order to maximize its potential. By analyzing

how the capabilities and limitations of ASAS affect the brigade S2, one can determine possible recommendations that will make it a more effective tool.

Assumptions, Limitations, Delimitations

Assumptions

To make an analysis of this topic viable, one must assume that the maneuver brigade and the DS intelligence company will be fielded with ASAS as projected by the US Army Intelligence Center and School. One also must assume that the communication systems required to support the ASAS will be available.

Limitations

The development and fielding of the ASAS are moving targets. Since it is constantly undergoing development and changes, data only will be current for a relatively short time. The Army plans to field the most advanced version of the ASAS in the years 2000-2006. However, to make the system's capabilities available to units as quickly as possible, the Army is fielding versions of the ASAS with partial capabilities during the interim years.[10] Because the advanced version of the ASAS is still only a concept and it is difficult to obtain data on that version, the research for this study must be limited to the prototype that will be fielded to the maneuver brigade in the 1995-1996 time frame, the ASAS-Warlord.

Delimitations

This study will focus on the maneuver brigade S2 and his integration of ASAS into the brigade's operations. In addition, because

the DS intelligence company will affect the brigade's use of ASAS, this study will consider its organization and capabilities. Other intelligence issues for the maneuver brigade not affected by the fielding of ASAS will not be considered. To prevent the study from becoming a never-ending cycle of new information, information current as of 15 February 1995 will be incorporated into the project. Later information, if it becomes available, will be considered only if it is a significant change in the ASAS system or a major factor for the analysis.

Definitions

All-Source Intelligence. Intelligence derived from multiple disciplines and sources. All source intelligence provides a complete picture and is more reliable than single source intelligence due to the confirmation provided by several sources.

All-Source Analysis System (ASAS). A computer-based brigade through Echelons Above Corps (EAC) level intelligence fusion system. ASAS receives, stores, and rapidly fuses battlefield information and intelligence into a variety of products for presentation to commanders in support of the decision making process.

DS Intelligence Company. Intelligence company organized and equipped to provide dedicated all source intelligence support to the maneuver brigade. The DS Company will be effective in 1996.

Intelligence Fusion. The correlation of information from multiple sources to provide an intelligence product.

Theater Intelligence. Intelligence derived from collection systems dedicated to the support of the Joint/CINC commander.

National Intelligence. Intelligence derived from collection assets under national control or outside theater control.

Signals Intelligence (SIGINT). Intelligence derived from analysis of the electromagnetic spectrum including voice communications, data communications, telemetry, and radar emanations.

Human Intelligence (HUMINT). Intelligence derived from human sources including enemy prisoners of war.

Imagery Intelligence (IMINT). Intelligence derived from the visual spectrum including photographs, electro-optical, thermal, infra-red and active radar.

Intelligence Preparation of the Battlefield (IPB). The systematic, continuous process of analyzing the threat and environment in a specific geographic area to support the staff estimate and the military decision making process.

Intelligence Collection. Process of obtaining intelligence information about the enemy through technical and non-technical means.

Intelligence Source. Person or system from which intelligence was originally obtained.

Reconnaissance. A mission undertaken to obtain information by visual observation, or other detection methods, about the enemy or geographic characteristics of a particular area.

Surveillance. The systematic observation of airspace or surface areas by visual, aural, photographic or other means.

CHAPTER 2

LITERATURE REVIEW

The Army's ability to support its combat forces with adequate intelligence is not a new controversy. There has been a significant amount of research on the need for intelligence and its importance to combat operations. The numerous works available on the subject show that considerable effort has been expended on identifying problems in the area of intelligence support at the division and corps level. Research directed specifically at the maneuver brigade, however, is much less prolific. For the most part, intelligence operations in support of the maneuver brigade has been approached as a subset of division operations. With few exceptions, research results that apply directly to the maneuver brigade must be extrapolated from works addressing intelligence issues at division level or higher.

Whether or not the maneuver brigade S2 can effectively integrate the capabilities of the All Source Analysis System into brigade operations appears to be a gap in research. Such research may have been conducted by the organizations responsible for developing and integrating the ASAS into the support concept for maneuver brigades. However, because ASAS was not originally designed to support the maneuver brigade, the S2's ability to integrate the system's capabilities may not have been considered. To study the S2's ability to integrate the system into his operations, one must consider his

doctrinal organization and functions and the intelligence problems encountered under current doctrine.

The most extensive research material available addresses the question of how the maneuver brigade commander is supported by the S2 and intelligence operations. Since Operation DESERT STORM, the US Army Military Intelligence Center has undertaken an ambitious program of rewriting the Army's intelligence field manuals (FMs) to update its doctrine in accordance with the Army's new operations manual, FM 100-5, Operations. These updates incorporate many of the lessons learned since the manuals were last written and take into account new technologies the Army is fielding in support of intelligence operations.

Already, the latest version of Intelligence and Electronic Warfare Operations, 27 September 1994, has been published and the initial draft of the S2 Handbook staffed. These documents are solid sources for intelligence doctrine. For the maneuver brigade, however, the Army has not yet staffed a new draft of FM 34-80, Brigade and Battalion Intelligence and Electronic Warfare Operations. The current version was published in 1986 and is inadequate for addressing how the Army currently intends to support the combat commander with intelligence. Of equal importance to the intelligence manuals are the manuals describing the doctrine of combat maneuver brigades. These publications identify how the combat commanders doctrinally integrate intelligence support into their operations. FM 71-3, Armored and Mechanized Infantry Brigades was last published in 1988 and, though it does not reflect the Army's most recent changes, is a reasonable source of maneuver doctrine.

In addition to the Army's doctrinal sources, students of the School of Advanced Military Studies at Ft. Leavenworth have been busy researching the topic of intelligence support to the maneuver brigade, and have included three monographs. The work by Smart focuses on the organizational and technological changes planned by the Army and analyzes whether or not these changes will work.[1] A valuable resource on intelligence operations, her monograph addresses the topic from the supporting unit's perspective and how divisional assets support the maneuver brigade. It does not, however, consider how the maneuver brigade commander integrates this support into his operations. In addition, because it was written in 1992, the monograph does not address the contributions of ASAS to the brigade.

A second monograph by Major Brian A. Keller focuses on the ability of the military intelligence battalion to support the operations of a heavy division.[2] Keller provides a solid background on the intelligence requirements which support the division commander, many of which can be extrapolated for application to the maneuver brigade. Because the Army's modernization effort is progressing rapidly, however, most of the intelligence assets and the doctrinal organization he describes will no longer exist at the time period considered by this study.

The third monograph, and perhaps most useful to this study, is by Major Terry B. Wilson. His monograph is an excellent source for information on the doctrinal relationship between the brigade commander and his principal staff officer for intelligence.[3] Written from the brigade perspective, Wilson has compiled an extensive look at how the S2

has doctrinally supported the maneuver brigade commander and how this support is affected by the requirements of a nonlinear battlefield.

In addition to field manuals and monographs, other significant research on current and future intelligence support is available in the form of articles and papers. Articles written for publications, such as Army and Military Intelligence, provide current sources for information on changing doctrine, force modernization, and intelligence operations.

Of all the research questions, perhaps the most important is the identification of intelligence problems or deficiencies in the maneuver brigade. There has been considerable research recently on addressing problems at the tactical level, including problems with intelligence support. In 1985, the Center for Army Lessons Learned (CALL) began publishing a series of newsletters identifying problem areas encountered by units rotating through the National Training Center. These newsletters point out problems and issues from which lessons can be drawn. The benefits from this program were quickly realized and CALL soon broadened its scope of research to include significant lessons from most exercises and operations. Some of the more poignant problems of combat intelligence operations internal to the maneuver brigade can be found in these publications.[4]

Of most significance to the identification of problems was the research conducted following Operation DESERT STORM. A large-scale operation, such as Operation DESERT STORM, was the perfect opportunity for the Army to learn from its experiences. A team from CALL was dispatched to Saudi Arabia to obtain written observations of what did and did not work well during the operation. Though observations on

intelligence topics directly related to brigade operations are few, the ones available are very useful.[5] Also of use are the after action reports written by intelligence personnel who participated in the operation and then consolidated under the U.S. Army Gulf War Collection Group DESERT STORM Study Project as primary documents for the Starr Report. These reports paint a more complete picture of the problems encountered during the operation than the observations of CALL. Also of significance is the research conducted by the MI Relook Task Force, which addressed intelligence issues specifically and published a white paper on the subject.[6] The results of the Task Force's research has become the basis for many of the doctrinal changes underway in Military Intelligence.

Other lesser, though useful, works include books, articles and papers written by participants in Operation DESERT STORM and other past conflicts. Major General John F. Stewart, Jr., examined intelligence operations during Operation DESERT STORM from his perspective as G2, Third US Army.[7] Though far removed from the maneuver brigade fight, Stewart addresses issues which have implications for the combat commander. Another good example is a study written by Colonel Richard J. Quirk, III who, as the G2, 24th Infantry Division, illuminates several issues involving his ability to support the maneuver brigades with intelligence.[8]

In reference to the research questions on the ASAS system, there is no research on the system yet uncovered from sources outside the purview of the US Army Training and Doctrine Command. However, this makes sense as the US Army Intelligence Center at Ft. Huachuca, AZ, is

the proponent for developing and fielding the system. Most of the information on the system required for this study is technical in nature and includes the ASAS's limitations, capabilities, and support requirements. Information is available from modernization plans, draft field manuals, and from the proponent offices at Ft. Huachuca.

CHAPTER 3

RESEARCH METHODOLOGY

The hypothesis for this study is that the maneuver brigade S2 will be able to effectively integrate the capability of the ASAS into brigade operations. To prove this hypothesis, one must use a hierarchy of mutually supporting questions from the thesis statement to those subordinate. To conduct an analysis answering the primary question and proving the hypothesis, this study requirs four secondary questions: (1) How does the S2 and his intelligence operations support the maneuver brigade commander? (2) What intelligence problems in the maneuver brigade does the Army intend to correct with ASAS? (3) What are the intelligence capabilities and limitations of ASAS? and (4) How will ASAS's requirements for communications, transportation, power, and training support affect its usefulness to the maneuver brigade? Each of these questions address a separate aspect of the thesis question and, in turn, have sub-questions of their own.

The Brigade S2

The first step in answering the primary question is to answer the first secondary question: How does the S2 and his intelligence operations support the maneuver brigade commander? This question, and the tertiary questions which support it, is designed to identify the S2's functions and responsibilities, the manpower and equipment

available to him, the physical environment in which he must operate, the intelligence support he receives from the division's military intelligence battalion, and how he interacts with both higher and lower intelligence staffs. By answering this question, one is able to identify the capabilities and limitations of the S2, his staff section, and the intelligence support he receives from division. Of primary importance is to identify exactly what it is that the maneuver brigade S2 is supposed to do. The supporting tertiary question: What functions and responsibilities are assigned to the S2? is designed to isolate the intelligence role the S2 plays in support of the brigade's operations. Identifying the S2's tasks and area of responsibility within the brigade provides a standard against which to measure the effectiveness of his ability to integrate the capabilities of ASAS. Capabilities enhancing his ability to accomplish required tasks or even make those tasks unnecessary can be considered effective. Capabilities which have no effect detract from his ability to accomplish required tasks, or add additional tasks to his workload can be considered ineffective.

Another concern for how the S2 supports the maneuver brigade commander is how his staff section is currently organized with manpower and equipment. The S2's staff section is the tool he uses to accomplish his doctrinal functions and responsibilities. Understanding the composition of the staff section and how the S2 currently uses it to carry out his responsibilities provides a basis for identifying how the S2 will integrate the capabilities of the ASAS. An analysis of the section's capabilities and limitations, coupled with the capabilities and limitations of the ASAS, will provide a means for measuring the S2's

ability to integrate ASAS against accomplishment of his functions and responsibilities.

In a combat environment, the maneuver brigade tactical operations center (TOC) will move and locate in accordance with the situation. Understanding how the S2 physically sets up and operates in the combat environment is critical to analyzing the integration of ASAS into his operations. The tertiary question: What are the field requirements of the S2? is designed to identify how the S2 sets up his staff section in the field, what his mobility requirements are, his need for split-Tactical Operations Center (TOC) operations, and how he ties in with the brigade staff. Understanding the S2's physical requirements in the field allows for an analysis of his ability to integrate the support requirements of ASAS into his operations.

In addition to his own internal analysis capabilities, the maneuver brigade S2 receives intelligence support from the divisional MI battalion. Since ASAS will also be fielded to the MI battalion's Direct Support (DS) intelligence company, the S2's ability to integrate the system into his operations will be directly affected by the support he receives from the MI battalion. Tertiary questions designed to identify information pertinent to this study's analysis include: What intelligence support does the DS intelligence company provide the maneuver brigade? How is the DS intelligence company organized and equipped to provide this support? How does the Army intend to transition from the current support provided by task organized MI teams to the DS intelligence company? and What is the current doctrine for intelligence support to the maneuver brigade?

The final question supporting this secondary question deals with the S2's doctrinal relationship with his intelligence counterparts at higher and lower levels. How intelligence is disseminated to him, how he disseminates intelligence to subordinates, what processes and procedures he uses to obtain intelligence, and what form the intelligence is presented in are all factors which must be understood in order to analyze the effectiveness of ASAS's capabilities when measured against how the S2 currently operates.

Answers to the above questions were researched in doctrinal publications, monographs, articles and papers, force modernization plans, equipment and personnel authorizations, and other similar sources. Questions had to be approached from several angles due to the ongoing changes in Army doctrine. For example, many field manuals were several years old and did not reflect the Army's current intelligence doctrine. This required a substantial amount of research in periodicals, papers, briefings, and other documents to find the most current information.

Intelligence Problems

Another secondary question that had to be answered was: What intelligence problems in the maneuver brigade does the Army intend to correct with ASAS? In other words, one must understand why the Army felt it was necessary to field the system to the maneuver brigade in the first place. To answer this question, one must identify the problems that S2s have encountered in their effort to support the brigade commander with intelligence. Answering this question offers a current

status against which one can measure the effectiveness of the integration of the system's capabilities.

Lacking first hand experience, one relies mainly on documented problems and lessons from various sources to answer this question. The numerous after action reports from units participating in Operation DESERT STORM, studies done by the MI Relook Task Force, articles and papers written by intelligence officers, lessons learned from the Combat Training Centers, books on past conflicts, and interviews with maneuver brigade S2s serve as sources. The tertiary questions which identified intelligence problems at the maneuver brigade level had to be tailored to specifically address those issues which are affected by the fielding of ASAS.

ASAS Capabilities/Limitations

Once it was well understood how intelligence operations were conducted at the maneuver brigade and what deficiencies and problems were present, it was time to determine what intelligence capabilities the ASAS had to offer. Identifying the capabilities ASAS provided intelligence operations at the maneuver brigade enables one to determine how it benefits the S2. It would also reveal those capabilities that current doctrine or operational reality do not support. While most of the capabilities of the system support the needs of the S2, there may be limitations that hinder his operations and make the system a liability.

ASAS Support Requirements

The final question to be answered involved the technical aspects of the system and whether or not they can be supported when the

ASAS is deployed with a maneuver brigade. This topic addresses the questions of communication requirements, mobility, power supply, and training. A system that cannot be supported with communications due to the brigade TOC's location is useless. In addition, a system that cannot be torn down and moved to another site as quickly as the brigade headquarters also may be of reduced value.

Both of the last two questions had to be researched through contact with the US Army Intelligence Center and School at Ft. Huachuca. Except for a draft field manual, force modernization plans and similar articles, most of the detailed information on ASAS is available only from the proponent organization. This information had to be obtained telephonically, by mail, and by fax.

Since the system is not yet fielded in support of maneuver brigades, little can be determined about its actual impact on brigade operations. However, ASAS systems similar to that which will be fielded to the maneuver brigade are already in operation at divisional Analysis Control Elements (ACE). Data obtained from the operation of these systems is relevant to the operation of the system in the maneuver brigade and much can be extrapolated for this study.

The strength of this method of research is that it provides a clear understanding of the problems and doctrinal application of intelligence at the maneuver brigade. The accessibility of historical documents and doctrinal literature from the US Army Combined Arms Center at Fort Leavenworth, KS, ensures that a thorough research of the subject can be conducted.

CHAPTER 4

BRIGADE INTELLIGENCE OPERATIONS

"Intelligence operations are the organized efforts of a commander to gather and analyze information on the environment of operations and the enemy . . . the commander drives the intelligence effort."[1] The S2 is the commander's principal advisor concerning intelligence. He manages the brigade's intelligence operations and assists the commander in identifying information requirements. The organization and equipment available to the S2, the environment in which he works, the intelligence processes he uses, and the outside support he receives largely will determine his ability to effectively integrate the capabilities of ASAS into brigade operations.

In managing the brigade's intelligence operations, the S2's primary responsibility is to provide the intelligence his commander needs to make sound tactical decisions.[2] The sum of the S2's doctrinal responsibilities are indicated by the battle staff tasks identified in ARTEP 71-3-MTP, the mission training plan for heavy maneuver brigades. These responsibilities include:

-Prepare the Intelligence Estimate.
-Prepare the Intelligence Annex to the Operations Order.
-Analyze incoming information from maneuver elements in conjunction with intelligence received from higher headquarters.
-Manage the intelligence effort.
-Process specific information requirements data.
-Process combat information and intelligence.
-Conduct aerial intelligence support planning.
-Maintain the brigade intelligence data base.

-Establish the Operations Security (OPSEC) data base.
-Monitor implementation of OPSEC measures.
-Develop a physical security plan.[3]

All of these tasks are designed to support the brigade commander's decisionmaking process and the execution of the brigade's operations. The complexity of the S2's responsibilities, however, requires that he have the support of a staff section to carry them out. How the section is manned and equipped will affect the S2's ability to integrate the capabilities of ASAS.

Organization and Equipment

As outlined in Figure 1, the S2's staff section includes two intelligence officers and seven enlisted intelligence analysts. Together, these personnel form the Battle Information Coordination Center (BICC), which provides the S2 an organic collection management, analysis, production, and dissemination capability. Under the supervision of the S2, the BICC controls and coordinates the brigade's intelligence effort.[4]

At first glance, it would seem the BICC has been adequately manned to support the S2's responsibilities. However, for the complexity and labor intensity of the intelligence effort, the BICC is only minimumly manned. Including himself, the S2 has ten intelligence personnel at his disposal. Since continuous operations are run over a 24-hour period, seven days a week, the S2's BICC doctrinally is split into two 12-hour shifts. The necessity to split the BICC into shifts dissipates the amount of effort the S2 can apply towards intelligence production. When mission requirements for coordination, reconnaissance, and additional duties, such as guard and equipment maintenance, draw

personnel away from the BICC; the strain on the S2's available manpower severely inhibits his ability to carry out his intelligence responsibilities. In Operation DESERT STORM, at least one commander noted that adequate Intelligence Preparation of the Battlefield (IPB) and focused collection fell apart because the small S2 staff could not effectively analyze the incoming information to answer the priority intelligence requirements (PIR). This affected the brigade's entire intelligence effort, leading to an inability to refocus the effort to provide updated information as the battle progressed.[5]

The austere manning of the BICC, therefore, is an important factor in the S2's ability to effectively integrate the capabilities of ASAS into his operations. The complexity of ASAS and the skills required to operate it effectively will have a large impact on the S2's ability to adequately train and maintain his staff section's proficiency. On the other hand, the capabilities of the ASAS may well compensate for the lack of personnel in the BICC, freeing them from some tasks in order to concentrate on analysis and providing the commander the intelligence he needs.

In addition to personnel, the equipment available to the S2 to conduct the intelligence effort is also important to determining the affect of ASAS on brigade intelligence operations. The equipment allocated to the S2 can be broken down into three groups: transportation, intelligence, and communications. For transportation, the S2 is equipped with an armored M577 Command Post Carrier and a 1 1/4-ton wheeled cargo truck. Both are used to transport the S2's equipment and personnel; however, the M577 doubles as a work area when

part of the brigade tactical operations center. In addition, the M577 has a 4.2KW direct current generator which provides electrical power to the S2.[6] To be effective, the S2 must be able to transport and power the ASAS using his M577, since it will serve as the work space in which the system will be used. Reliance on the 1 1/4-ton cargo truck would not be appropriate as it may not be available in the event the brigade tactical operations center (TOC) must move. Therefore, the ASAS must be rugged enough to withstand the vibrations of the M577, be of a size that will allow it to fit within the vehicle, and be capable of operating off the available power generation equipment.

Doctrinal intelligence equipment available to the S2 are rudimentary and consist simply of a map board, stereoscope, and cameras.[7] This equipment is intended to support the maneuver brigade S2's manual intelligence system which relies on hand written journals, workbooks, charts and data bases. Automation of the S2's intelligence processes is primarily a local initiative with units supplying their own stand-alone computers to manage enemy information in a data base. Though the Army's ability to collect information on the enemy has increased significantly over the past 15 years due to improved collection systems, the brigade S2 retained his manual intelligence system which has become decreasingly effective in processing an increasing volume of information. While the manual system is readily taught and cross trained among BICC personnel, it can no longer cope with the amount of information provided by current collection systems. If the S2 can effectively integrate the capabilities of the ASAS into

his operations, his greatest benefit will be from the system's capabilities in the area of information management and communications.

Organic communications systems available to the maneuver brigade S2 include tactical VHF FM radio (SINCGARS) and a wide area network known as Mobile Subscriber Equipment (MSE). Using SINCGARS, the S2 communicates with division via the division's Operations and Intelligence network (O&I) and with subordinate elements over the brigade O&I network. The division O&I network provides the S2 a means for receiving intelligence and information from the division G2. The S2 also uses this network to report brigade information and intelligence to the G2 and to pass requirements and requests for additional intelligence support. The brigade O&I network links the BICC to the battalion S2s and provides a means for coordinating, tasking, and disseminating combat information and intelligence. The supporting direct support (DS) intelligence company may also be assigned to this net, which provides the S2 the capability to task and receive reports and information from their resources. As stated in Chapter 1, intelligence dissemination was a serious problem for the maneuver brigade during Operation DESERT STORM. A major contributor to the dissemination problem was that the brigade's O&I networks were over committed and unsuitable for intelligence use.[8]

The second communications path available to the S2 is MSE. MSE permits the S2 to conduct voice and data communications with any similarly equipped unit within the network. The major problem the S2 encountered with MSE during Operation DESERT STORM was the system's inability to transmit facsimile in a timely manner. Without facsimile

transmission, graphics and overlays had to be couriered to the recipient. Since SINCGARS and MSE are the brigade's primary means of radio communications, and already display an inadequacy for supporting intelligence operations, the communications requirement for operating ASAS will be a significant factor in determining whether the S2 can effectively integrate it into the brigade's operation. The ASAS must either be capable of using the communication paths available to the brigade without degrading its operations or an additional communications path must be provided. Even if the ASAS can be successfully integrated into the brigade's operations considering the S2's personnel and equipment factors, the physical environment in which the S2 works will determine if it can operate when the S2 needs it most.

Field Environment

The brigade S2 and his BICC deploy and operate as part of the brigade's main command post tactical operations center (TOC). The brigade TOC functions primarily as a coordination, information, communications, and planning center and is physically arranged to facilitate work, security, take advantage of cover, and permit quick displacement. Within the TOC, the S2 concerns himself with the activities required to sustain current and plan for future intelligence support to operations.

The brigade TOC is doctrinally located to the rear of battalion task forces, out of range of enemy direct fire and mortar fire where possible, but close enough to maintain SINCGARS communications with their command posts.[9] As such, any system used by the S2 will be subject to the vibration, jarring, moisture, temperatures and dust

inherent in any field operation. If deployed in desert terrain, extremes in temperature could decrease the habitability of the S2's work space and cause electronic equipment to overheat and malfunction. The printed circuits of electronic systems are known to swell in extreme heat, creating increased maintenance problems. In addition, dust and sand could contaminate the air cooling the electronic equipment. This would require special air filters designed to keep out sand to prevent eroding components. If deployed to a coastal area, sustained high humidity may cause fungus growth within circuits resulting in premature system failure. Although temperature and humidity may not directly affect a particular tactical operation, their extremes affect the use of electronic systems such as the ASAS by reducing personnel and equipment capabilities.[10]

For the S2 to effectively integrate the capabilities of the ASAS into brigade's operations, the system must be rugged enough to withstand the abuses of the environment with minimal failure. The S2 must be able to rely on the system's availability, especially if it is his primary means of managing the intelligence effort. How reliable the system is, and how much of a manual back-up the S2 must maintain in the event of failure, will determine its utility to him. For example, if the system is prone to failure in a dusty environment, and the brigade is operating in the desert, then the S2 will have to commit an unacceptable amount of effort to maintaining a back-up data base to ensure that it is available when he needs it. Such a need would negate the benefits derived from an automated system since his personnel are now duplicating their efforts.

An additional consideration is mobility. In a fast paced combat environment, the brigade TOC may be required to move frequently. To effectively integrate the system, the S2 must be able to prepare the ASAS for movement within the timelines prescribed by the brigade's standard operating procedures. In turn, the S2 must also be able to quickly get the ASAS operational to provide responsive intelligence support, normally less than 30 minutes. With little protection from the elements afforded by the brigade TOC, and the need for frequent moves, the ASAS will have to be rugged and simple to set up if the S2 is to effectively integrate it into the intelligence processes he uses to support brigade operations.

Intelligence Processes

In carrying out his responsibilities, the S2 plans and directs the brigade's efforts to collect information, process it into a useable form, produce the needed intelligence, and disseminate it. These tasks comprise a continuous, five-step process known as the intelligence cycle, the doctrinal system for providing the commander intelligence which focuses on his mission and concept of operation.[11] The intelligence cycle is the heart of the intelligence processes available to the S2 in support of his commander. Since ASAS was designed to support the intelligence cycle, how the S2 applies these processes is integral to his ability to integrate the capabilities of ASAS into his operations.

As a member of the commander's staff, the S2 supports the decisionmaking process by providing the intelligence products necessary to course of action development and wargaming. During Operation DESERT

STORM, the S2's detailed template of the Iraqi's defensive positions allowed the 1st Brigade, 1st Infantry Division to accurately plan operations to breach a half mile of Iraqi obstacles.[12] This template was a product of the intelligence processes used by the S2.

Planning and directing the intelligence effort is the over-arching process that focuses the other four steps of the intelligence cycle on a single goal, providing the commander the intelligence he needs. In planning and directing the intelligence effort, the S2 identifies information requirements, develops a plan to collect the information, issues specific orders and requests for collecting the information and producing the intelligence, and monitors the availability of collected information.[13] As such, planning and directing is a management function that directly corresponds with ARTEP 71-3-MTP collective task: "Manage the Intelligence Effort." The effect of ASAS on the S2's ability to plan and direct the intelligence effort primarily will be a result of its effects on the other four steps of the intelligence cycle.

The first step of the S2's intelligence cycle that ASAS may have a direct affect upon is collection. Collection is the process of acquiring information for processing and production into intelligence. For the brigade S2, collection is planned and executed to obtain the information needed to satisfy the commander's PIR and information requirements (IR). A focused brigade collection plan is necessary to manage the collection efforts of the brigade and subordinate battalions and also because current and accurate information is not always available from higher echelons. In Operation DESERT STORM, maneuver

brigades found that little information was available from higher echelons on the Iraqi units they were to attack and the disposition of their defenses. Brigades found that much of the information provided by national intelligence agencies conflicted on aspects of Iraqi equipment and command and control.[14] Because of the VII Corps deception plan, brigades were not allowed to actively collect information until after the start of the ground war. Instead, the brigades had to rely almost exclusively on higher echelons to satisfy their PIR and IR. Once the ground war started, however, brigades were capable of conducting their own collection efforts to obtain the intelligence they needed. The importance of planning the collection effort was highlighted by at least one commander during Operation DESERT STORM who indicated that the lack of a collection plan was a serious weakness in his unit.[15] The need to plan collection, then, is important to providing the commander the intelligence he needs. The formal collection management tool for the brigade S2 is the Reconnaissance & Surveillance (R&S) plan. The addition of an automated system, such as the ASAS will affect how the S2 uses the R&S plan for managing the brigade's collection effort.

While some automation may have been introduced through local efforts, especially in the area of a database, the S2's doctrinal methods for planning and directing the intelligence effort require the use of manual tools such as matrices, templates, and overlays. The R&S plan is no exception. It assists the S2 in managing the information requirements which require collection, the assets that conduct the collection, and the time constraints within which the intelligence is needed.[16] To develop the brigade R&S plan, the S2 coordinates with the

S3 to ensure that it includes the commander's information requirements and that it supports the commander's concept of operation. The S2 also coordinates with subordinate and supporting units, adjacent brigades, and the division to integrate their information requirements to provide a unified effort that fully supports the brigade's operation.[17] A lack of this coordination, both laterally and with higher echelons, has been a common problem observed at the Joint Readiness Training Center where S2's were found to rarely synchronize their R&S plans to support the unit's mission.[18] While the S2 determines the brigade's information requirements through face-to-face coordination with the commander and staff, the requirements of division, subordinate, supporting, and adjacent units are normally coordinated remotely using voice, facsimile, or couriers to transmit the information.

The S2 receives intelligence acquisition tasks from the division in the division Operations Order (OPORD). He receives information requirements from subordinate, supporting, and adjacent units in the form of R&S plans, which are disseminated as an appendix to the intelligence annex of their OPORDs. Currently, these R&S plans are transmitted for coordination as written hard copy and overlays which are either couriered or electronically transmitted via facsimile machine. Because the brigade collection effort involves continuous planning, updating, and revising to satisfy information requirements, the current method of transmitting R&S plans for coordination is rarely effective in a fast-paced operation. Intelligence is only of value if the commander receives it in time to influence the planning and execution of his operations. If the ASAS is capable of networking the brigade S2 with

the intelligence officers of the other units to permit timely coordination of information requirements, then ASAS will have a positive affect on the S2's ability to perform collection management.

In order to collect the information needed to satisfy the commander's PIR, the S2 must maintain the current status of organic, attached, or supporting collection assets. These assets include subordinate combat battalions, supporting artillery and engineers, and the DS company of the divisional MI battalion. By knowing the current status of these collection assets, the S2 is able to identify the collection assets available to satisfy best the information requirements in his R&S plan. The brigade S2, however, cannot plan for continuous reconnaissance operations. Except for the DS intelligence company, almost all assets assigned to the brigade have secondary missions, such as for engineers, aviation, and fire support.[19] Any information requirements that cannot be satisfied by these collection assets must be forwarded to the division G2 for possible collection.[20] If the ASAS is capable of transmitting R&S plans to intelligence elements both laterally and higher and lower, it will have a positive affect on the S2's ability to coordinate his collection effort and synchronize it to support the unit's mission.

Since it was designed as an intelligence analysis system, the ASAS will have a significant impact on the intelligence processing step of the S2's intelligence cycle. Processing is the step of the intelligence cycle where the S2 converts the information obtained during the collection process into a form that can be used to produce intelligence. Processing consists of three operations: recording,

which reduces information to written or graphical representation and organizes it into useable groupings; evaluation, which determines the applicability of the information to the operation, its accuracy, and the reliability of the source; and analysis, which determines the significance of the information as it relates to known information and intelligence.[21] Again, the intelligence system currently available to the brigade S2 is a manual one. Processing is conducted at the BICC in two shifts, using a journal, map board, and a grease pencil or color coded sticker system that displays the information. Each shift consists of an officer, a non-commissioned officer, and two to three analysts.

The message traffic is screened for targets and significant pieces of information that might answer the commander's PIR. Key information is worked immediately with the rest passed to the analyst working the map board. At the map board, the information is correlated with other reports on the same unit and unit positions are plotted and updated. If the flow of information is too heavy, maneuver and artillery unit information is given top priority, resulting in potentially useful information being buried.[22]

Recording information reduces it to a written or graphical form and organizes it into useable groupings. Doctrinal recording methods currently available to the brigade S2 include the intelligence journal, situation map (SITMAP), intelligence files, and intelligence workbook. However, the brigade S2's limited resources, personnel and tight time constraints often permit only the use of the intelligence journal and SITMAP.[23]

The S2 uses the intelligence journal to record reports and messages, significant events, and the actions that were taken in response to those events. The journal is a handwritten, chronological record normally covering a 24-hour period and is a tool for organizing and maintaining accountability of information.[24] The information the S2 receives from various collection sources is normally in hard copy form to facilitate handling with the resources he has available. This information may have been transmitted either by courier, facsimile, or transcribed from voice communications. Though labor intensive, the journal provides the S2 an effective means of recording information.

To complement the written entries of the intelligence journal, the S2 also relies on the SITMAP to graphically record information. The SITMAP provides the commander and staff with a graphic presentation of the battlefield and visually organizes significant information from all sources. The S2 manually constructs the SITMAP using map boards with acetate overlays to portray the brigade's area of operations and grease pencil or stickers to post enemy information. Enemy information posted on a SITMAP includes disposition and boundaries, headquarters, defensive positions, minefields, and contaminated areas.[25] The S2 transfers enemy information to the SITMAP by manually transcribing it from written or verbal form or by transferring it from other overlays.

Other recording tools available to the S2, but often of limited use due to personnel and time constraints, include intelligence files and workbooks. Intelligence files are used by the S2 to organize and store information for easy retrieval. The files most commonly maintained are the journal file, reference file, and the order of battle

(OB) file. Journal files contain all previously recorded journal sheets and supporting materials and are used as an historical record to identify and locate information. Reference files serve as a repository for all information that is not of immediate interest but may be of future value. OB files include OB information collected at various times from various sources and provide the S2 a database on the characteristics of the enemy for use in his analysis. The intelligence workbook is a doctrinal tool for the S2 to sort, evaluate, and interpret information on the enemy. Specific information on enemy units are recorded on worksheets in categories such as organization and strength.[26] Because the S2's recording aids are manual, the addition of an automated system such as the ASAS has great potential for enhancing the efficiency of his recording process. Like the current manual aids, the system would have to be readily available and the information accessible for the S2 to effectively integrate them into his operations.

After the S2 has received and recorded the information, he must evaluate it to ensure its validity, accuracy, and pertinence to the brigade. Incoming information is evaluated based on the source, time, and existing information. This is can be a difficult, but necessary, task for the S2 considering the manual system he is using. The optimum for evaluating the reliability of the source is to have sufficient historical information to be able to establish a track record. However, this is time consuming for the S2 and he may rely mainly on his knowledge of the source and past experience with it.

For the S2, accuracy is determined by the reliability of the source and by correlating the information with existing information. As

discovered during Operation DESERT STORM, accurate information cannot be ascertained without comparing it with existing information. In the desert, units found that they couldn't make assessments based on a single SPOT report. While the locations provided in the report were accurate due to the Global Positioning System (GPS), the element making the report often inaccurately stated the size of the enemy force.[27] The accuracy of new information only can be determined by comparing it with the enemy order of battle and existing information, a time consuming step for the brigade S2 in a fast paced environment.

Valid and accurate information is of little value, however, if it is not applicable to the brigade. The S2 must quickly determine whether the information applies to the brigade to prevent wasting efforts on processing the information. Applicability of the information can be based on a combination of factors including location, activity, and the enemy unit. Determining the applicability of the information is accomplished manually by the S2 using his knowledge of the brigade's mission and existing information. The ASAS can affect the S2's ability to evaluate information if it can assist in the correlation and identification of information that meets the brigade's requirements.

Information that has been collected and evaluated is analyzed by the S2 for its significance as it relates to known information and intelligence. The S2's process of analyzing the threat and environment in a specific geographic area is known as the intelligence preparation of the battlefield (IPB). The S2 uses IPB to determine the feasibility of enemy courses of action (COA) and reduce uncertainties in predicting what the enemy will do. It provides a graphic estimate that allows the

commander to carry out and maximize his combat power by describing the environment the unit is operating within, the effects of the environment on the unit, and determining the threat's likely COAs.[28]

The current lack of automation in the maneuver brigade slows down the IPB process. The utility of automation to support the maneuver brigade was recognized as early as the Vietnam War, where forward deployed intelligence support teams identified the need for automated databases to improve their exploitation of enemy sources.[29] Today, the S2 continues to perform map reconnaissance, personal reconnaissance, and relies on IPB products from division to conduct his analysis. Unlike the brigade, the division has assets to perform detailed IPB including a terrain topography team, weather team, and an all source intelligence production section. The IPB products from division are of most value to the S2 when they can be delivered in time to assist in planning the brigade's operations. In fast-paced operations, this is rarely effective.[30]

The expertise for analyzing terrain is at the division level. In absence of terrain products from division, the S2 must conduct his own terrain analysis through map and personal reconnaissance. In the maneuver brigade, the S2 normally prepares a single terrain product, the modified combined obstacle overlay (MCOO). The S2 bases the MCOO on the commander's requirements, but normally depicts only unrestricted terrain, restricted terrain, and severely restricted terrain.[31] However, when time and resources permit, the S2 can develop other graphic terrain products to depict the effects of the terrain on brigade operations. As an example, during Operation DESERT STORM, the S2 of the

1st Brigade, 1st Infantry Division constructed a cardboard terrain model and used a computer to generate 3-D perspective drawings to help commanders visualize the terrain.[32] The addition of ASAS to the maneuver brigade will significantly enhance the commander's ability to visualize the battlefields if it can provide timely dissemination of divisional terrain products and permit the manipulation of terrain information as was done by the 1st Brigade, 1st Infantry Division. The S2 uses the products of terrain analysis to determine its effect on the enemy to help predict enemy courses of action.

For the S2 to predict the enemy's most likely COA, he first must evaluate the enemy. The S2 analyzes the enemy OB information he has available to determine how the enemy normally organizes for combat and conducts its operations. Since the S2 currently has a limited analysis capability, he must have access to the OB files and products at higher echelons in order to conduct his analysis for the brigade. Once the OB files and products are received from division, the S2 must manage and access the information using the manual, hard copy filing systems available to him. As an analysis tool, the ASAS will significantly enhance the S2's ability to determine threat COAs if it will provide him timely access to intelligence files and permit him to retrieve and manipulate the information to develop the intelligence products required for the brigade's mission.

Intelligence production integrates the results of collection and processing into a product that is meaningful to the commander and staff. In fact, time constraints and the demands of battle tend to make the separate steps indistinguishable.[33] As part of the decision making

process, the S2 develops enemy COA models that portray the enemy for the staff and prepares event templates and matrices that focus on intelligence collection and identify which COA the enemy will execute. Graphics permit the commander to visualize the battlefield much more readily than written text. Following Operation DESERT STORM, commanders emphasized their desire for graphic intelligence products that were responsive to their requirements.[34] Graphic intelligence products produced by the S2 and used by the staff include doctrinal, situation, event, and decision support templates. Doctrinal templates convert enemy OB data into graphic format and depict how the enemy operates when unconstrained by the effects of the battlefield environment. Doctrinal templates can be compared with the threat data base to reveal doctrinal deviation in the composition, organization, and deployment of enemy units.[35]

Situation templates are doctrinal templates adjusted to reflect weather and terrain constraints portrayed on the MCOO and are portrayed against current dispositions. One task for the S2 during Operation DESERT STORM was to produce a template of Iraqi defenses. By applying Iraqi doctrinal tactics to current intelligence, the S2 was able to provide the commander a detailed template of the possible Iraqi defensive measures most dangerous to the brigade's attack.[36] Event templates identify and analyze significant battlefield events and activities which provide indicators of enemy COAs. The event analysis matrix correlates expected events and activities within individual Named Areas of Interest (NAIs) and adds the dimension of time.

Decision support templates are intelligence and operations estimates combined in graphic form. They relate the details of the event template to decision points that are significant to the commander, and identify critical battlefield areas, events, and activities which require tactical decisions by time and location. Regardless of what product is produced, intelligence is meaningless if it cannot be provided to the commander when he needs it.

Perhaps the largest problem during Operation DESERT STORM was poor intelligence dissemination. FM 34-8-2 defines intelligence dissemination as the timely conveyance of intelligence to users in a usable form. The S2 is the staff officer responsible for this timely conveyance of information and intelligence to units subordinate to and supporting the brigade, to the division, and to adjacent brigades.[37] The S2 is also responsible for the brigade's target acquisition program where he identifies high priority targets from intelligence collection and disseminates them to the S3 and Fire Support Officer for engagement.[38] For the brigade, obtaining intelligence to support their own mission is an historical problem.

After action reports from Operation DESERT STORM indicated numerous problems with brigades not receiving intelligence from higher echelons. Though the maneuver brigade doctrinally requires intelligence out to 30 kilometers, they do not have the reconnaissance capability to collect information that far. Therefore, during Operation DESERT STORM, brigades had to rely on intelligence from division and higher, which they had difficulty getting. Instead, brigades found that the results of division-level reconnaissance were not passed to them and, though

corps and theater collection assets were highly capable, they did not have the ability to disseminate intelligence timely enough to support brigade operations.[39]

Brigade commanders found that the intelligence flow was too slow and restricted to meet their needs. For example, units involved in the breach operations did not receive current imagery until two days before the attack.[40] Up until then, commanders had to plan their operations using imagery that were more than three weeks old. Despite this, the S2s were able to produce detailed templates of enemy positions by projecting what the defenses would look like on the day of the attack.[41]

The most critical dissemination challenge during Operation DESERT STORM involved communications, even for the division. 3rd Armored Division dispatched liaison officers to VII Corps and ARCENT and used aircraft to courier imagery and reports in order to receive them 5-8 days earlier than through existing communications channels. The division's ability to disseminate intelligence reports to the brigades was even worse, since the MSE facsimile equipment took an extraordinarily long time to transmit. In one example, it took the 3rd Armored Division G2 three to four hours to transmit a five page report.[42] An automated system, such as the ASAS, will have a profound affect on the S2's ability to support his commander if it can provide the communications link necessary to get the needed intelligence.

External Intelligence Support

Intelligence support for the maneuver brigade is provided by the DS intelligence company. The DS intelligence company is designed to

provide the maneuver brigade with counterintelligence, human intelligence, imagery intelligence, and all-source intelligence support. The company provides its support through three major sections: a company headquarters, which provides command and control for the unit's operations; an Analysis Control Team (ACT), which supports the brigade with all source intelligence; and an operations platoon, which supports the brigade with counterintelligence, interrogation, unmanned aerial vehicles, and imagery processing. The DS intelligence company replaces the former intelligence support structure consisting of an Intelligence and Electronic Warfare Support Element (IEWSE) and a task organized IEW company team. The IEWSE consisted of a company grade intelligence officer and a non-commissioned officer who normally collocated with the maneuver brigade TOC to advise and assist the brigade commander and coordinate intelligence support.[43] The commander of the IEW company team was primarily responsible for the mission of supporting the brigade with his organic intelligence collection and EW assets. The responsibilities of these two organizations are being combined to form the DS intelligence company, with the company commander assuming the responsibilities that were formerly the IEWSE's.

The DS company commander advises the brigade commander and staff of capabilities, limitations, integration and use of intelligence assets. He also assists in integrating and synchronizing the use of supporting intelligence assets and in preparing taskings for collection.[44] Though the DS company commander will not be able to provide the dedicated support of the IEWSE intelligence officer due to his command responsibilities, the ACT actually enhances his ability to

support the brigade by providing capabilities not formerly available. Instead of the IEWSE's two personnel, the ACT is manned by a junior intelligence officer and five enlisted intelligence analysts. The ACT is also better equipped than the IEWSE with SINCGARS, MSE, and an ASAS terminal (Figure 2).[45]

Chapter Summary

For the sake of organization, the key findings of this chapter are summarized for use in the analysis of the capabilities and limitations of ASAS. First, the shortage of manpower available to the S2 in the BICC must be considered. While ASAS may reduce the workload placed on the few analysts, it may also require a level of proficiency that is not easily trained and maintained throughout the section, thereby reducing the effectiveness of ASAS.

Second, ASAS must be compatable with the equipment available to the S2, especially in communication, power generation and transportation. A system not capable of utilizing the communications available or rugged enough to withstand the transportation means or power fluctuation will prove useless.

Third, in the field environment the ASAS will have to be rugged and easily set up. The frequent moves of a brigade TOC in fast-paced combat will require the system to be able to accept considerable abuse as it is set up and torn down over and over again. A system that fails and is not available when the S2 needs it is really no system at all.

Fourth, there is little doubt that any automation of his intelligence processes will enhance the S2's ability to manage the brigade's intelligence effort. The measure will be the amount of

benefit the S2 will see from ASAS in comparison to any detractors of the system.

Lastly, the S2's ability to effectively integrate the capabilities of ASAS must be considered in relation to the support the brigade receives from the DS company. The ASAS' capacity for promoting a unity of effort between the brigade and its supporting organization will aid in determining the S2's effectiveness.

CHAPTER 5

ASAS CAPABILITIES AND LIMITATIONS

The Army has recognized that the maneuver brigade S2 needs to automate his intelligence processes in order to adequately support the commander. In the official document that identifies the maneuver brigade S2's need for intelligence automation, the Mission Need Statement, the Army justified the need by acknowledging that "while the capability of collection systems has increased, the methodology for tactical dissemination and processing of information has remained virtually unchanged."[1] While the Army's ability to collect information has increased significantly through modernization of its intelligence sensors and collectors, the maneuver brigade S2 has continued with the capabilities provided by manual methods of conducting intelligence operations. The large advances achieved in the automation of intelligence sensors and collectors in the 1980's now permits the collection of large volumes of time-sensitive, perishable information. The maneuver brigade S2, with the manual methods available to him, can neither access nor process these large volumes of information and still meet the timeliness required to support his commander.[2]

In order to develop a system that could satisfy the need to automate the maneuver brigade S2's methods of processing and disseminating intelligence, the Army had to specify the requirements for the system. The ASAS Operational Requirements Document (ORD), which

specifies the minimum acceptable requirements, states that the system must be designed to "significantly improve the present processes in the functional areas of intelligence development, target development, collection management, electronic warfare support, and counterintelligence and operations security support."[3] Considering the time consuming methodology currently available to the S2, it wouldn't be hard to significantly improve his ability to process information.

As discussed in Chapter 4, the S2's intelligence processes are still performed primarily using manual methods. Where automation has been employed, the S2 adopted whatever automation means were available to him such as commercial off-the-shelf computers and software. Some units even set up automated electronic mail or bulletin board networks to transmit intelligence products to their users. While enhancing the processing and dissemination of intelligence, this localized and often uncoordinated effort created problems of incompatible hardware and software, even within the same unit.

To compound the problem, the security requirements for Sensitive Compartmented Information (SCI) prohibits the processing of SCI on most of these commercial automation systems. Therefore, the processing and sanitization of SCI had to be accomplished using manual methods before data could be released to collateral users such as the maneuver brigade.[4] What the Army needed was a standardized intelligence processing system that could interoperate from the maneuver battalion to echelons above corps (EAC). For the Army, that system is the ASAS.

What Is ASAS?

The ASAS was developed to meet the Army's requirement for providing mobile intelligence automation support to the commander from maneuver battalion to EAC. The ASAS provides the commander with two distinct benefits. First, ASAS substantially increases the commander's ability to process information and produce intelligence. Second, it provides him an efficient means of obtaining and disseminating intelligence.

The automation provided by ASAS replaces many of the manual methods that previously were used to process and produce intelligence. For example, instead of analysts sifting through incoming messages for information pertinent to the commander's PIR and IR, the ASAS does the sifting automatically and then alerts the analyst when important information is received. Also, instead of requiring analysts to transcribe this information from the message to a mapboard, the ASAS automatically plots the new information on the SITMAP, which can be viewed either from a screen or a printout. This kind of automated information handling provides the S2 a substantial savings in time and effort, permitting his analysts to concentrate more on actual analysis and answering the commander's PIR.

To process and produce intelligence, however, one must also be able to quickly collect the needed information and disseminate the intelligence to the users. Without communications, ASAS is simply a computer system that automates many of the intelligence processes. However, when interfaced with a communications architecture that connects it to intelligence sources and processors of multiple echelons,

ASAS becomes a powerful tool for obtaining information and disseminating intelligence. One of the requirements of the ASAS Operational Requirements Document is that the system must be able to operate with existing Army intelligence sensors and systems; other Army command and control nodes; joint, theater, and national intelligence sensors and systems; and the intelligence processors of other services.[5] With a communications architecture that links all of these systems, the commander has access to the most current information available and the ability to disseminate it quickly to his subordinates. To handle the large volume of multi-disciplined information available from battalion to EAC sources requires a robust system. To accomplish this, the ASAS itself is broken down into three distinct subsystems: The ASAS-All Source (ASAS-AS), the ASAS-Single Source (ASAS-SS), and the ASAS-Remote Work Station (ASAS-RWS).

Of the three subsystems, the ASAS-AS is the largest and most robust. The ASAS-AS is a large, six workstation system that provides the capability to receive, fuse, and process large volumes of information from multiple sources. The ASAS-AS is fielded down to the division level and provides the Analysis Control Element (ACE) with an automated tool to produce and disseminate the intelligence the division commander needs.

The ASAS-SS is also fielded down to the division level; however, its purpose is focused on collecting and processing information from the efforts of a single, highly technical intelligence discipline, SIGINT. The ASAS-SS supports the commander by passing information

collected by SIGINT sources to the ASAS-AS, where it is fused with information from other sources to produce all-source intelligence.

Like the ASAS-AS, the ASAS-RWS is an automated tool to receive, fuse, and process large volumes of information and produce and disseminate intelligence. Unlike the ASAS-AS, the ASAS-RWS is much smaller and purposefully less capable, with only one workstation in order to fit mobility and space constraints. The ASAS-RWS is the system that will be fielded to the maneuver brigade S2.

The ASAS-RWS provides the maneuver brigade S2 with a tool to automate his intelligence processes. The ASAS-RWS is a rugged computer system that communicates using a fiber-optic local-area-network (LAN) or a communications port, processes information using a high-speed microprocessor and software applications, and provides intelligence products via screen display or printer.[6] The operator uses programs resident in the workstation to manipulate information which is displayed on the monitor as text, map images, and overlays.[7] As an intelligence tool, the ASAS-RWS automates many of the methods the S2 uses to plan, coordinate, and conduct intelligence operations. With its interface with the ASAS at the supporting DS intelligence company, subordinate battalions, and the division G2/ACE, the S2 can use the ASAS-RWS to pass PIR and IR; guidance on intelligence collection, processing, and reporting; and intelligence estimates, summaries and annexes.[8] The ASAS-RWS also interfaces with the S3's Maneuver Control System (MCS) to share both the friendly and enemy data bases with the operations staff. The ASAS-RWS automates the S2's IPB process and provides him the

capability to produce text and graphic intelligence products for use in the decision makingprocess.[9]

It must be emphasized, however, that the ASAS-RWS is only a tool. It cannot collect information nor can it analyze information. It simply automates the S2's manual methods. The S2 still retains his responsibilities for managing the brigade's intelligence effort and providing the timely intelligence the commander needs.[10]

ASAS and the Brigade S2

Because the Army has not yet fielded ASAS to the maneuver brigade, one must look at the division and corps level, where the ASAS has been fielded to the G2 and the ACE, for data to support an analysis of the brigade S2. By doing so, one can identify how the capabilities and limitations of ASAS have affected the operations of the ACE and use them as indicators of the effect of ASAS on the brigade S2. The experiences at corps and division will assist in the analysis of whether or not the S2 can effectively integrate the capabilities of ASAS into brigade operations.

Organization and Equipment

In the last chapter we discovered that the S2 has an austere staff section. For the S2 to effectively integrate the ASAS, he must be able to take advantage of the system's capabilities with the personnel he has available and without loss of support to the brigade commander. Experience at the corps ACE found that the capabilities provided by ASAS permitted a substantial increase in the efficiency of its intelligence operations. Using the old manual and semi-automated methods, I Corps'

ACE required 10 analysts to plot the information obtained from 2,000 messages in eight hours.[11] With ASAS, however, the ACE found that it could plot the same volume of information with a single operator in only three minutes.[12] Experience with ASAS at the division ACE demonstrated similar benefits. Using ASAS-AS, the 1st Cavalry Division processed over 27,000 messages in 52 hours during a recent Battle Command Training Program (BCTP) exercise. As significant as that was, the speed with which they were able to provide the commander an intelligence product was even more important. Within 15 minutes of an event, the analysts of the division ACE were able to "receive and log a message, correlate the data, update the database, query the data base, display the intelligence picture of the battlefield, and produce a graphic intelligence summary (INTSUM)."[13] ASAS clearly demonstrated its capability to significantly increase an analyst's ability to process information and disseminate intelligence. From these results, one might determine that intelligence operations using ASAS require less manpower than the previous manual methods.

Organization

Though 1st Cavalry Division found that an ASAS operator could access the same intelligence picture that previously would have taken three maps and 12 analysts to develop, the idea that automation replaces people is a false one.[14] Before ASAS, the large volume of information received frequently overwhelmed the intelligence support elements at both corps and division. This was one of the problems that ASAS was intended to correct. ASAS increases the capabilities of the ACE to fully benefit from the capabilities of modern collectors and sensors.

In the transition from the former Intelligence Support Elements to the ASAS equipped ACE, however, the Army reduced the personnel authorization for the ACE to only two operators per workstation, one for each 12 hour shift. Since the ASAS-AS has six workstations and each one must be manned, this minimum number of operators cannot provide the flexibility required to conduct continuous, 24-hour operations. Performing complex tasks at a computer terminal over several hours is tedious at best. Experience has demonstrated that if an operator works too long at a workstation, he tends to be drawn "inside the box," a form of target fixation in which the operator becomes unaware of the important events occurring around them.[15] The requirement for two ASAS operators per workstation per shift can be considered a limitation for the system. For the brigade S2, a reduction in personnel would negatively affect his ability to effectively integrate the capabilities of ASAS into brigade operations.

The ASAS-RWS provides the brigade S2 with a single workstation. As experienced at division and corps, the capability of ASAS to increase an analyst's ability to process information and quickly produce and disseminate intelligence would be a significant benefit to the S2's ability to manage the brigade's intelligence effort. If he retained his current personnel authorization of two non-commissioned officers and five analysts, the S2 would have two ASAS operators on each 12-hour shift. This would provide the S2 with the flexibility he needs to operate in a fast moving combat environment. However, if the Army sees fit to reduce his personnel authorization to one ASAS operator per shift, the S2 will find that, while he has an increased intelligence

capability, his ability to use it actually will be less considering the operator's effectiveness and other section responsibilities. Therefore, the S2 should retain his current level of manpower in order to effectively integrate the capabilities of ASAS into brigade operations. The manpower available to the S2 is also important due to the fact that ASAS is a complex system which requires substantial operator training to take full advantage of its capabilities.

A second limitation of ASAS is that it requires a high degree of technical proficiency to fully use its capabilities. Unlike the manual methods of intelligence processing, analysts need computer skills which are perishable and require regular training in order to maintain proficiency.[16] Since one of the greatest benefits of ASAS is its interoperability with the intelligence systems of other echelons, operator proficiency training will require access to simulation resources capable of exercising the full range of the ASAS's capabilities.[17] Simulation required to fully train on the ASAS is beyond the resources normally available to the maneuver brigade S2. Therefore, simulation must be part of an overall program which routinely exercises the division intelligence system. The broad aspect of such a training program would not be unlike the training programs required to maintain other perishable intelligence skills, such as foreign languages.

With languages, organic training assets in tactical units are insufficient to maintain the high degree of proficiency required. As a matter of efficiency, units establish language training programs encompassing all linguists of a specific language and normally contract

for training support. For the ASAS, a training program supporting all ASAS operators would be necessary to maintain a high degree of operator proficiency. Since the brigade S2 will have only a single workstation, he must be included in the training program in order to provide his analysts the opportunity to routinely practice their skills.[18] At a minimum, the S2 will require a communications link with his counterpart at division in order to pass daily information and provide his analysts the training they need in garrison.

Though the daily processing of real world intelligence and the maintenance of database information on contingency areas and missions can double as training in garrison, it is not sufficient to train ASAS personnel to a wartime standard.[19] The use of ASAS will need to be an everyday operation within the S2 section. One complaint from the Analysis Control Element (ACE) at 1st Cavalry Division is that they never run the ASAS except for simulation and that they don't get the opportunity to exercise receipt of data directly from collectors.[20] If operating ASAS in garrison is difficult for the division ACE, it will be nearly impossible for the maneuver brigade S2.

To overcome its limitations and effectively integrate the capabilities of ASAS into the brigade's operations, then, the S2 will need to retain the number of personnel authorized. To reduce his already austere staff because of the increased capabilities of ASAS would only decrease his ability to take advantage of those capabilities. In addition, because the ASAS is a complex system, the S2 will require external support to sustain the proficiency of his operators. Before ASAS, the S2 and the BICC could train on the manual intelligence

processing methods using assets organic to the brigade. With ASAS, however, the S2 will require support from the division to fully train on the most beneficial capabilities of the ASAS: its ability to quickly process information and disseminate intelligence.

Equipment

The equipment the S2 uses in his operations falls into three categories: transportation, intelligence, and communications. For transportation, the primary vehicle used by the S2 in combat is the armored M577 Command Post Carrier. This vehicle serves as the S2's workspace and, until replaced by the armored Command and Control Vehicle, will be the vehicle in which the ASAS-RWS is mounted.[21] Assuming that units will rearrange the current equipment within the M577 to make room for the ASAS-RWS, the main concern for the system will be its ability to withstand the vibrations of the vehicle and still function.

The Army Combat Systems Test Activity (CSTA) at Aberdeen Proving Ground, Maryland, conducted vibration tests on the ASAS in 1994. Using the vibration profile of a tracked vehicle, the test's vibrations resulted in major physical damage to the ASAS chassis subsystem and printer which would make them inoperable. CSTA then downgraded the tests to the vibration profile of a wheeled vehicle and found, once again, that the ASAS chassis and printer were damaged.[22] This demonstrates that, as currently configured, the ASAS cannot be mounted in the S2's M577 and be expected to remain operational in the field. However, because the findings were provided to the ASAS Program Office, it can be reasonably assumed that the fielded system will be made more

rugged to overcome this limitation and permit its mounting in an armored command vehicle as required by the ASAS Operational Requirements Document (ORD).

Mounting the ASAS-RWS in the S2's M577 would enhance his ability to use the system since it would require little effort to set up. The only other option would be to transport the system in its ruggedized carrying case, requiring the system to be disassembled and reassembled every time the brigade TOC jumped. While the ASAS would be just as effective in processing information when transported in its carrying case, the effort required to pack and set up the system would detract from the S2's mobility and create a greater workload for the BICC when jumping.

Another equipment consideration for the S2 is the electrical power he has available to run the ASAS, which can draw from either commercial or generated sources.[23] At the corps and division, multiple 30KW generators are used to supply power to the ACE and have proved to be a good, reliable source of electrical power for the ASAS.[24] The maneuver brigade S2, however, has only a 4.2KW DC generator organic to his section. Since the ASAS uses alternating current (AC) electrical power, this generator cannot be used to power the ASAS unless the electricity is somehow converted. In addition, since the generator is mounted on the M577, it creates a considerable amount of noise in the vehicle when running and is, in practice, seldom used.

Another source of electricity for the S2 is the S3 section, which has an organic 3KW AC generator to support the TOC. This generator has the capacity to power the ASAS; however, the addition of

other new systems to the TOC, such as the MCS, and the unreliability of the generator make it an unsuitable source of electrical power. Many heavy brigade TOCs obtain a 30KW generator, though unauthorized, to supply their power needs. This generator has been found to be quiet and very reliable. In order for the S2 to effectively integrate the ASAS into the brigade's operations, the generator supplying electrical power to the TOC will have to be upgraded from the currently authorized 3KW in order to provide sufficient capacity and reliability for all of the brigade's new systems.

In addition to transportation and power generation, the S2 also has a few pieces of basic intelligence equipment. ASAS is a large technological step from the manual and semi-automated equipment available to the S2 to conduct intelligence operations. The ASAS replaces the mapboards and grease pencils the S2 currently uses with a keyboard, monitor, and printer. More than just the hardware, the real tools of the system lies within the ASAS's software, providing the S2 the capability to convert coordinates and calculate distances, manipulate files, print reports and overlays, plot overlays to map scales, create reports and messages, and disseminate intelligence.[25] The application software of the ASAS-RWS provides the S2 with automated tools to support the brigade intelligence effort.

Unlike the mapboard and grease pencil, however, the ASAS is complex to operate and not user friendly. In a recent CASCADE PEAK exercise, I Corps experienced six extended down periods with the system. In this case, because it was an exercise, I Corps was able to back-up its operations with another ASAS.[26] However, for the maneuver brigade

S2, there is no second system to back-up ASAS in the event of system failure. If the system goes down, the S2 may end up with nothing to show for his efforts. To overcome this limitation and effectively integrate the capabilities of ASAS into his operations, the S2 must develop a back-up system for his ASAS. The backup system can be either manual or semi-automated, but it must enable him to continue operations until the ASAS is working again. Whatever his method of backup, the S2 must have connectivity with intelligence organizations at other echelons in order to fully use the capabilities of ASAS.

The ASAS-RWS is capable of interfacing with the Army's current local and wide area communications networks and with IEW special purpose communications systems.[27] With these communications, the brigade S2 can use the ASAS-RWS to quickly disseminate collateral intelligence throughout the brigade and link with the ACT, division ACE, and activities and intelligence sources at all other echelons.[28] The ASAS-RWS provides the S2 this capability by digitizing message traffic and automating many of the standard communications interfaces that support intelligence operations. Each ASAS-RWS has its own signal address and interfaces with other collateral ASAS workstations via local or wide area networks. MSE, as the brigade's access to a wide area network, provides the primary means of data communications for ASAS and has proven to be a very reliable communications path. Since MSE is already a secure system up to the collateral SECRET classification level, the brigade S2 needs no additional equipment.

As with MSE, the brigade S2 already has SINCGARS communications equipment. SINCGARS is normally used by the S2 for voice

communications. It can, however, also be used to digitally transmit data. When used with the ASAS-RWS, SINCGARS must operate in the single channel mode, which precludes the use of the SINCGARS' frequency hopping capability and leaves its signal susceptible to interception and jamming.[29] 1st Cavalry Division's experience with MSE and SINCGARS has shown that the communications links work well and do not limit the use of ASAS.[30] Since the maneuver brigade S2 is already supported by MSE and SINCGARS, he should be able to effectively integrate the ASAS's communications capabilities into his operations. The only problem to be solved is frequency management for SINCGARS. To use ASAS on this system, the S2 will require a dedicated frequency since the O&I net is also required for the S3's voice communications.

Field Environment

Like most other systems, the ASAS can be subject to maintenance failure due to the environmental extremes of brigade combat operations. To test its susceptibility to the extremes of a field environment, the Army Combat Systems Test Activity (CSTA) subjected the ASAS to a series of environmental tests including temperature, humidity, lightning, saltfog, altitude, rain, fungus and dust. Of the eight tests, two demonstrated shortcomings in the ASAS which could eventually lead to system failure.

The first shortcoming was discovered during the test to determine the ASAS's susceptibility to fungus. The test found that if the ASAS is not properly maintained, microbial deterioration of the system's components could lead to its failure. To combat this, CSTA

recommended that PMCS of the ASAS include regular inspections and that components be wiped clean at the slightest sign of fungal growth.

The second shortcoming identified by CSTA was ASAS's susceptibility to dust. Though the ASAS was operational following the dust test, CSTA found that dust had penetrated inside the chassis subsystem and was on circuit cards, disk drives, hard drives, and all other internal components. Though it did not cause the ASAS to fail, the ability of dust to penetrate the system so thoroughly would eventually lead to system failure due to wear on working parts and overheating.[31] To further complicate the problem, access to the inside of the ASAS is above operator-level maintenance and would require the assistance of maintenance technicians to clean it. Brigade operations in a dusty environment could create the conditions for the ASAS to fail unless it is either properly sealed and vented using air filters or the operators provided a means of removing dust from the system. With these modifications, the S2 should have little problem operating the ASAS in a dusty environment.

At the opposite end of the environmental spectrum is the operation of ASAS in a rainy climate. Though the rain test at CSTA demonstrated that the ASAS will remain dry if kept in its rugged carrying case, it did not address how well the system itself operates in a rainy environment. Field experience at 1st Cavalry Division demonstrated that the ASAS does not tolerate a high level of moisture. During one windy and rainy exercise, while operating the system in a tent, the division had problems with frequent downtime of their ASAS. However, when moved to a vehicle where it was better sheltered from the

elements, the ASAS experienced very few problems.[32] For the maneuver brigade S2, this experience indicates that the ASAS is best employed inside his M577, rather than dismounting it in the TOC where it is less sheltered. For the S2 to effectively integrate the full capabilities of the ASAS, the system must be capable of continuous operation 24 hours a day, seven days a week for extended periods of time under tactical conditions.

Because the brigade's intelligence requirements do not stop when the TOC moves, the ASAS must be capable of operating at a degraded level during tactical redeployment.[33] The ASAS Operational Requirements Document specifies the minimum acceptable system performance during tactical redeployment as maintaining "65% of peak hour message throughput (input/output) with no more than 40 percent degradation in system response."[34] The ASAS, however, does not yet have this capability.[35] Though tests conducted during Operation DESERT CAPTURE II in 1994 demonstrated that the capability to process intelligence on the move does exist, it is currently limited by technology and interoperability.[36] For now, the S2 will have to overcome this limitation by setting up a system with the division ACE and the DS intelligence company to hold his message traffic until he is again operational and processing information.[37] How long it takes to set up the ASAS-RWS is another consideration in the S2's ability to integrate it into brigade operations.

Transporting the ASAS during tactical redeployment requires that the S2 go through the cycle of tearing down and setting up the system every time the brigade TOC jumps. The ASAS has proven, however,

to be a very easy system to set up for operation. Experience at the 2d Armored and 1st Cavalry Divisions demonstrated that the division ACE easily can get the ASAS operational within 30 minutes. For the ACE, the large ASAS-AS is transported in an expandable van which must be opened and the system unpacked before it can be made operational. For the maneuver brigade S2, the time required to get the ASAS-RWS operational would be even less since it will already be mounted in his M577 and require only minor set up including communications and electrical power. This particular aspect of the ASAS permits the S2 to meet the time lines required for jumping the TOC.

A further concern for the brigade S2 is the utility of ASAS in the event that the system malfunctions. Fortunately, except for catastrophic failure, the ASAS has the capability to operate in a degraded state. For the ASAS, a defective component or software process which precludes the full utilization of the system is considered to be a degraded condition. In deciding to operate under degraded conditions, the S2 must weigh the benefit of continuing to operate the ASAS against the risk of further damage to the system. One particular benefit of the ASAS is that, in the event of a communications failure, the S2 is still able to manually enter information or messages using the keyboard or available disc drives in order to continue using the ASAS's intelligence processing capabilities.[38]

Intelligence Processes

Intelligence officers, technicians, and analysts who have used the ASAS agree that the system has significantly improved the ability of the tactical intelligence community to produce intelligence. Where the

division and corps intelligence support elements once used several personnel and multiple mapboards to sort through volumes of messages and plot information, ASAS now performs the laborious task of sorting and plotting information and requires only a single mapboard for collection planning. Processing, which used to occur four hours after the event, now is processed within 15 minutes of the event using ASAS. In addition to faster information processing, the ASAS provides the S2 with the capability to produce a color graphic printout of the enemy situation at the same scale as the maps used by the commander and staff.[39] ASAS not only changes the way the S2 processes information and produces intelligence, it also provides him a tool for managing requirements, collection, and operations.

As with the current method of planning and directing the intelligence effort, the S2 identifies the commander's priority information requirements (PIR) and information requirements (IR) using IPB products developed from database files and participation in the battlestaff wargaming process. Unlike the current method, however, the S2 now can electronically record and coordinate PIR and IR with division, subordinate, supporting, and adjacent units using ASAS.[40] The capability to quickly coordinate information requirements and synchronize collection taskings significantly enhances the S2's ability to operate in a fast-paced environment. Better still, the S2 can utilize the ASAS's digital communications to dynamically retask collection assets in the event of an updated plan or a changed situation.[41] The S2's ability to collect information is further enhanced by his ability to directly access the databases of national,

joint, coalition, and host nation sources. This capability allows him to pull the information he needs to satisfy the commander's PIR and IR from sources which were previously unavailable to him. The ASAS has no inherent limitations that will negatively affect the S2's ability to integrate its capabilities into his management of the brigade intelligence effort. Quite the contrary, the ASAS provides the S2 with a management tool improving his ability to rapidly coordinate information requirements and synchronize the brigade's collection efforts.

Perhaps one of the greatest benefits ASAS provides the S2 over previous methods is its ability to process information. ASAS replaces most of the S2's manual journals, files, workbooks, and SITMAPS. It automatically logs, posts, files, routes, and displays messages, reports, imagery and graphic information.[42] This automatic processing frees the S2 of a majority of the time consuming manual process of logging message traffic, updating databases, and plotting information.[43] Information received manually can be loaded into the ASAS by the operator for processing and forwarding as information reports. The ASAS also provides the S2 with the capability to store a minimum of three to seven days of the average wartime volume of data.[44] This capability enhances the utility of the ASAS and reduces the S2's need for classified storage space.

For recording information, the ASAS also has the capability to automatically notify the S2 when a message with key information is received. The S2 accomplishes this by setting information criteria, such as a specific unit or geographic area, which the ASAS uses to

recognize important information and alert the operator. Critical alarms also can be set, using the same criteria method, for information that meets the commander's requirements for indications and warning. Using the ASAS's alert and alarm features allows the S2 to immediately access critical information, saving him a substantial amount of time from having to manually sift through incoming information. In addition, the S2 can query the system, allowing him to compare new information to reports already in the database.[45]

The ASAS-RWS connects the maneuver brigade S2 with the division G2 via MSE or SINCGARS communications. From the G2, the S2 has access to the collateral All-Source Correlated Data Base (ASCDB), which the G2 automatically forwards to the S2 to keep him abreast of the current and projected enemy situation.[46] To develop the situation, analysts can rapidly access both historical and current information that has been received from any source, automatically correlate information from all sources, and develop and maintain the current situation and picture of the battlefield.[47] The ASAS-RWS forms this picture with more detail and less probability of error than the previous manual methods.[48] The templates developed in the IPB process can also be shared between echelons, permitting the S2 access to updated IPB products he can modify and disseminate as required.[49] Besides enemy information, the S2 can take advantage of the ASAS's capability to display weather information and process and display digitized terrain data.[50] The S2 can use the terrain capabilities of the ASAS to create and modify areas of interest and identify restricted areas, enemy avenues of approach, and mobility corridors.[51] The S2 now can spend more time analyzing the results of

intelligence reports instead of manually developing MCOO and situation products.

The intelligence products the S2 requires does not change with the use of ASAS. ASAS simply changes and automates the methods by which intelligence products are produced. Like any other computer, the ASAS processes information and extracts data according to the criteria set by the operator. If the criteria is not accurately set, information extracted will be of little use.[52] The ASAS, however, is capable of producing most any intelligence product. It provides the S2 with the capability to create, manipulate, and plot graphic overlays and templates; display imagery such as J-STARS overlays, Unmanned Aerial Vehicle (UAV) Live Video, UAV Freeze Frame; animate the enemy situation overlay; and produce a graphic intelligence summary (INTSUM). The graphic INTSUM is a classic example of the S2's ability to use the ASAS to produce a better intelligence product than before.

The INTSUM is a written product that summarizes the enemy's activities and is normally produced daily. INTSUMs are intended to provide the commander with a mental picture of the battlefield; however, they tend to be lengthy and hard to digest. A graphic INTSUM lays out all the information in a cartoon, which is much easier and faster to comprehend and is a quick method to provide commanders and staffs a snapshot of the battlefield. Before automation, it took a significant amount of effort to lay out and produce a graphic INTSUM. Using ASAS and a color printer, however, only a single analyst is needed to produce a real-time picture of the battlefield. During the III Corps BCTP WARFIGHTER exercise, the 1st Cavalry Division was able to produce a new

graphic INTSUM every 15 minutes. The INTSUM showed all known locations in red symbols with grid coordinates. It worked so well that the commander made decisions from the graphic instead of the map.[53] At the 2d Armored Division, the ACE used ASAS and a wide screen display to animate the INTSUM. Using the historical database, the G2 was able to provide the commander with a clear understanding of how the enemy has progressed and predict what his intentions were. Through the communications capabilities of the ASAS, this common picture can be rapidly disseminated to subordinate staffs.

ASAS provides the S2 with a significant increase in his ability to manage the brigade intelligence effort. The communications capability of ASAS allows the S2 to obtain information and disseminate intelligence that had been a serious problem before. Now the brigade can get the same information as division at the same time division does.[54] The S2 also doesn't have to worry about being overwhelmed with information. Using specific criteria, the S2 can set the parameters of the ASAS to accept only that information in his area of interest. Because the ASAS automatically processes the information, the S2 isn't concerned with his analysts being buried in message traffic and not able to conduct the analysis necessary to produce the intelligence the commander needs. The value of ASAS to the maneuver brigade was proven during Operation DESERT CAPTURE II, when ASAS was successfully used to disseminate near real time intelligence down to the maneuver brigade and battalions.[55] In fact, ASAS-Warrior, the predecessor to ASAS-RWS, was also used by 2nd Armored Division to provide intelligence down to its maneuver brigades during a BCTP exercise.

External Intelligence Support

The true test of ASAS/brigade S2 integration is whether or not the S2 can deliver on the commander's PIR every time, on time. To do this, however, requires the support of external intelligence organizations. With ASAS, the S2 will have access to intelligence from national and theater systems, corps and division ACE, and the DS intelligence company. Higher echelons are responsible for focusing their efforts downward, broadcasting their intelligence products and pushing critical information to the tactical commander. For his part, the brigade S2 is responsible for accessing the higher echelon databases and pulling the information his commander needs.[56]

The primary intelligence organizations with which the S2 works are the division G2/ACE and the DS intelligence company. Both of these organizations are ASAS equipped and can share databases with the brigade S2. As previously mentioned, the division ACE is equipped with highly capable ASAS-AS and ASAS-SS. Both of these systems process information classified up to the SCI level. The ACE, however, also maintains the collateral ASCDB, which it passes to the ASAS-RWS in the G2 for planning and dissemination to other organizations. With ASAS, the brigade S2 has greater access to the efforts of the larger and more capable intelligence assets supporting the division G2. In addition, with the reorganization of the divisional MI battalion, the S2 has increased intelligence support in the form of the DS intelligence company.

Like the brigade S2, the DS intelligence company is equipped with an ASAS-RWS to support the brigade's intelligence effort. With its communications link to the brigade ASAS, the DS intelligence company

provides organic capabilities for automated, multi-discipline intelligence including imagery processing, unmanned aerial vehicles, interrogation and document exploitation, and counterintelligence as well as a command and control assets to accept reinforcing capabilities such as ground based SIGINT collection and jamming (Figure 3). By comparison, the predecessor to the DS intelligence company, the IEW company team, was unresponsive to the needs of the brigade commander. The unresponsiveness of the IEW company team was primarily due to its reliance on a single source of information, SIGINT. Secondly, the only imagery capability provided by the IEW company team was a ground surveillance platoon, which was routinely deployed forward with the maneuver battalions and was only capable of supporting the close fight. Finally, the IEW team was not capable of augmenting the brigade staff with all-source intelligence analysis, collection management, or dissemination. The team basically functioned as a direct support collection asset for the maneuver brigade commander with staff assistance provided by the IEW Staff Element.

The new DS intelligence company, however, provides the maneuver brigade S2 with a substantial improvement in responsive intelligence support. First, the company is no longer focused on SIGINT as the primary source of information. Instead, the DS intelligence company accesses SIGINT sources of division and higher echelons via ASAS to obtain the information required to answer the commander's PIR. In addition, the DS intelligence company also includes a UAV section to fly reconnaissance missions in support of the brigade and an imagery processing section to receive and process imagery such as J-STARS. Most

importantly, the DS intelligence company has the Analysis Control Team (ACT), which is equipped and manned to augment the brigade S2 as a condensed version of the division ACE. Information sources, both organic and external to the DS intelligence company, pass reports and raw data to the ACT, which assists the S2 by correlating and analyzing information under his direction and managing information requirements, mission tasking, and dissemination. ASAS provides the data link which ties the brigade's intelligence effort to the external support necessary to support the commander.

CHAPTER 6

CONCLUSIONS

There can be little doubt that the maneuver brigade S2 will be able to effectively integrate the capabilities of ASAS into the brigade's operations. Though the ASAS is a new and complex intelligence system, the capabilities it provides the S2 correct many of the problems he previously faced in managing the intelligence effort.

This study's analysis of the S2 looked at the organization and equipment he has available to conduct the brigade's intelligence effort. There, the study found that the S2 Section is inadequately manned to provide the timely intelligence the commander needs using manual processing methods. Though modernization increased the capability of intelligence collectors and sensors to provide information, the brigade S2 retained a manual methodology that could neither access nor cope with the new capabilities. In contrast to the task of satisfying the commander's growing demand for current and timely information, the S2's capability to access that information had become inadequate to accomplish his job. The ASAS helps correct this problem by providing the S2 with the tools he needs to benefit from the increased capabilities of modern collectors and sensors. Because the automation provided by ASAS greatly increases the efficiency of the intelligence process, and because ASAS provides the communications necessary to access required information, the S2 will be able to effectively

integrate the capabilities of ASAS into the brigade's operations with the same manpower he has available.

The S2 has a mix of old and modern equipment at his disposal for intelligence operations. Since the new Command and Control Vehicle has not yet been fielded, the S2 continues to use the M577 for transportation and workspace. The ASAS-RWS is of a size and configuration that makes it possible to mount it inside the M577 and enhance the S2's ability to utilize the system. Though testing has demonstrated that the prototype ASAS is incompatible with the vibrations of tracked vehicles, the system most likely will be made more rugged to meet this requirement. If not, the S2 can transport the ASAS in its rugged carrying case. In addition, the S2's authorized source of electrical power continues to be generators which are not conducive to the use of ASAS. However, many brigades already recognize that the current authorized generators are insufficient and have developed local solutions to meet their needs. Like the commercial computers brigades already take to the field, the S2 will be able to effectively integrate the power requirements of ASAS into brigade operations.

The communications systems currently available to the brigade S2 are quite adequate to support the ASAS. In fact, since ASAS was designed to operate on MSE and SINCGARS networks, communications will not be an obstacle to the ability of the S2 to effectively integrate the capabilities of ASAS into the brigade operations. To the contrary, the communications capabilities provided by ASAS actually enhance the S2's ability to perform intelligence operations.

In a field environment, the S2 must deal with environmental factors and the situational necessity to relocate his operations. Tests of the ASAS have shown that the system can continue to operate under adverse environmental conditions. As long as ASAS is operated in the shelter of a vehicle and is well maintained, adverse environmental conditions should not affect the S2's ability to effectively integrate the capabilities of the system. When jumping the TOC, ASAS has demonstrated to be a quick and simple system to set up. Since the ASAS-RWS will already be mounted in the S2's M577, the time required to bring it into operation primarily will be constrained by the setup of communications and electrical power support. The ASAS's capability to operate in a degraded state will also enhance the S2's ability to integrate it into the brigade's operations. His ability to continue using the ASAS for critical mission requirements, even though the system is not fully functional, adds to the system's utility.

Intelligence processing is the heart of the capabilities of the ASAS. Even standing alone, the information processing and intelligence production capabilities of the ASAS-RWS are a significant improvement over the manual methods previously available to the S2. When combined with the ASAS's communications capabilities, the S2 has a powerful tool with which to manage the brigade's intelligence effort. Because the doctrinal processes the S2 uses to provide the commander with intelligence are not changed by ASAS, the S2 will be able to logically integrate the automated methods of ASAS into his operations. The efficiency provided by the capabilities of the ASAS and the intelligence architecture of which it is a part all support the S2's intelligence

mission. His ability to get the full benefit from the system will be limited only by his proficiency with the system.

The external support available to the S2 has grown with the fielding of ASAS. With ASAS, he will have direct access to higher echelon information and intelligence products. He also will have better coordination with the G2 and actually share in the fruits of the intelligence effort by the division ACE. In addition, the DS intelligence company provides the S2 with intelligence capabilities he previously did not have. The DS intelligence company now has an ACT, an intelligence section dedicated to supporting the brigade with all-source intelligence, and additional intelligence sections which support the S2 with further access to EAC collectors and sensors. The additional support provided by external organizations is made possible with the ASAS, which links them to the brigade in a seamless intelligence architecture.

FIGURE 1

CURRENT MANNING FOR THE G2/ACE AND S2/BICC

Division G2/ACE
Total Personnel: 50

Heavy Division G2 Section:

POSITION	NON-SHIFT	DAY SHIFT	NIGHT SHIFT
G2	1		
SGM	1		
G2 Ops Off		1	1
G2 Plans Off		1	1
OB Tech		1	1
ASAS Operator		1	1
Total:	2	4	4

Division ACE:

POSITION	DAY SHIFT	NIGHT SHIFT
ACE HQ		
OIC	1	1
NCOIC	1	1
ASAS Operator	1	1
SYNCHRONIZATION		
OIC	1	1
Senior Analyst	1	1
ASAS Operator	5	5
ANALYSIS		
OIC	1	1
Senior Analyst	1	1
ASAS Operator	6	6
CCS Operator	2	2
TOTAL:	20	20

Brigade S2/BICC
Total Personnel: 11

Heavy Brigade S2 Section:

POSITION	NON-SHIFT	DAY SHIFT	NIGHT SHIFT
S2	1		
Assistant S2			1
Intell Off		1	
Senior Analyst		1	
Analyst		2	4
Carrier Driver			1
Clerk Typist		1	
TOTAL	1	5	6

Sources: U.S. Army, ASAS-CE User Functional Description (Washington,

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FIGURE 2

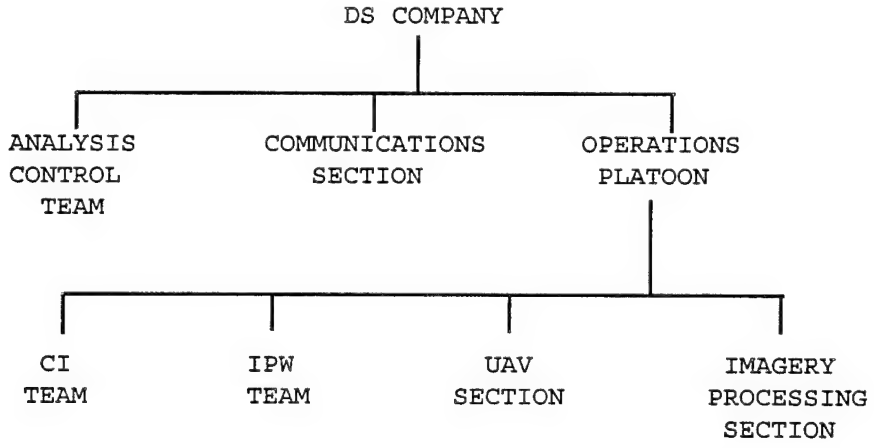
ANALYSIS CONTROL TEAM

PERSONNEL:	EQUIPMENT:
1 x O2	M577
1 x E6	HMMWV
1 x E5	SINCGARS
3 x E4 Analysts	MSRT (MSE)
	ASAS-RWS

Source: U.S. Army, The New MI Battalion Organizations: Providing Information on Time, Every Time!, Briefing provided to CGSOC students on 3 March 1994 by the U.S. Army Intelligence Center.

FIGURE 3

DIRECT SUPPORT INTELLIGENCE COMPANY



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